

FOURTH MONITORING REPORT

VERSION 01 DATED 20th January 2009

**FOR THE PERIOD
01ST JANUARY 2008 TO 31ST December 2008**

**"Biomass based independent power project at Malwa Power Private
Limited, Mukatsar, Punjab"**

Reference no. UNFCCC00000331CDMP

Project Location:

**Village Gulabewalla, Tehsil Mukatsar, District Mukatsar
Punjab, India**

**Malwa Power Pvt. Limited
1255, Sector 14, Faridabad-121007
Haryana, India**

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Current Status of the Project

The biomass based power plant had been successfully commissioned by Malwa Power Pvt. Ltd. (MPPL). The project was completed with major equipment supplied as follows:

<u>S. No.</u>	<u>Equipment</u>	<u>Supplier</u>
1.	Boiler	Thermax Limited, Pune
2.	T.G. Set	M/s Triveni Engineering & Industries Ltd 12A, Peenya Industrial Area Bangalore, India
3.	Balance of Plant	Various suppliers like Kirloskar Electricals, Bangalore for Transformers /Switch Yard and other major electrical equipments; Hyper filtration, New Delhi for RO/Water softening plant; Paltech Sahibabad for Cooling Tower etc.
4.	Fuel Handling System	Kwality Engineering New Delhi

The entire equity was provided by the Company (MPPL) and loan was taken from IREDA.

During the present monitoring period i.e. 01st January 2008 to 31st December 2008, the plant exported net power of 51.29 Million kWh to PSEB grid and consumed 75,712 MT of biomass as fuel.

**Statement to What Extent the Project has been
Implemented as Planned**

This project was completed as planned and described in the Project Design Document (PDD).

The plant is in operation continuously (with outages – forced & planned) since commissioning. Commercial operation was declared on April 27, 2005.

Monitoring Period

This is the fourth monitoring report associated with the MPPL project activity.

The first monitoring report covered the period from 01/05/2005 to 31/03/2006. (Both days included) and was issued 42,337 CERs.

The second monitoring report covered the period from 01/04/2006 to 31/12/2006. (Both days included) and was issued 35,894 CERs.

The third monitoring report covered the period from 01/01/2007 to 31/12/2007. (Both days included) and was issued 49,757 CERs.

The period covered in this monitoring report is from 01/01/2008 to 31/12/2008 (Both days included). This monitoring report does not cover any period of time covered by any of the previous monitoring reports.

Sustainability – Economic and Social Well-being

The project activity has contributed to sustainable development in the region as follows:

1. The project activity has created employment opportunities in the area for skilled and unskilled labour during operation and maintenance of the power plant. The project activity has generated opportunities for the uneducated and poor for collection and supply of agro waste material. The biomass collection activity has benefited approximately 1400 families from villages in and around the plant by way of revenue from selling the surplus biomass residues to the project plant.
2. MPPL has encouraged and motivated the unemployed, educated youth to arrange tractors, trolleys, chippers etc to transport the biomass to project site.
3. MPPL has motivated the farmers in the regions to adopt mechanized farming methods by way of demonstration plantations on the MPPL land. This has helped in increasing awareness and technical know how of the farmers, thereby increasing yield as well as providing an additional source of income for the farmers by selling the surplus biomass residues to the company.
4. By generating clean power, project activity has helped to eliminate an equivalent Carbon dioxide, Sulphur dioxide, Nitrogen oxides, SPM etc. which would have been otherwise generated to produce electricity in the grid. The project activity also helps to conserve finite natural resources like coal and natural gas which dominates the fuel mix in the regional grid.
5. By generating decentralized power close to load points, the project activity has helped reduce transmission losses.
6. The project proponent also actively promotes social welfare activities in the neighbouring villages by providing financial and material aid to the poor and underprivileged.
7. The Sarpanch of Gram Panchayat of Gulabewala has acknowledged the valuable contribution of the project proponent. The project proponent has also been encouraging computer and science education among the children by paying their annual computer learning fee and establishing a science lab.

Obtained Parameters According to Monitoring Plan

For the project, following parameters were monitored on a continuous basis.

1. **Energy:** The net electricity exported to the grid by the project activity has been monitored through a main meter and check meter installed at the interconnection point for the delivery of the energy to the grid. Monthly joint meter readings have been taken and signed at interconnection point by representatives of both MPPL and Punjab State Electricity Board (PSEB). MPPL has used these joint meter readings to raise the invoices to PSEB against the net energy exported to grid (net saleable energy). MPPL has maintained all records of joint meter readings at the interconnection point as well as the monthly invoices raised against net saleable energy to PSEB. Furthermore, continuous monitoring of gross electricity generation and auxiliary consumption is being carried out at the generation end (at the power plant) as well. Records of the same are being maintained in the plant log books.
2. **Fuel (Biomass):** Biomass fuel used in the power plant is weighed by electronic weigh bridge installed at project site. The quantity of biomass is consumed is recorded on daily as well as monthly basis.
3. **Fossil fuel:** No fossil fuel has been used during the current monitoring period.
4. **Energy Content of Fuel:** The energy content of fuel/biomass is measured as and when the biomass is received at the power plant site. A sample from the biomass received at plant is taken and tested for its GCV before being used in the boiler. The GCV content of each type of biomass is reported once in the monitoring report based on the internal audit conducted for calorific value of biomass used.

Power Generation, Export & Import, Fuel Consumption and Fuel Analysis

Monthly data on gross power Generation, export of power to the grid, import of power from the grid, fuel consumption, fuel analysis and Net Emission Reductions for the monitoring period are as shown in the tables below:

Table 1: Fuel consumption and analysis

Billing month	Year	Firewood (MT)	Mustard Husk (MT)	Wheat Straw (MT)	Paddy waste (MT)	Cotton stick (MT)	Total quantity of biomass consumed (MT)
GCV	2008	3,690	3,235	3,370	3,230	3,460	--
Jan	2008	468	174	47	177	5,901	6,767
Feb	2008	516	8	213	20	5,374	6,131
Mar	2008	563	0	1,515	35	4,548	6,661
Apr	2008	542	149	2,770	12	2,635	6,108
May	2008	251	117	2,497	11	2,494	5,370
Jun	2008	310	177	1,834	14	3,331	5,666
Jul	2008	236	520	3,515	159	1,967	6,397
Aug	2008	282	544	4,633	220	352	6,031
Sep	2008	1,011	630	3,638	110	998	6,387
Oct	2008	1,135	1,388	2,585	998	314	6,420
Nov	2008	672	0	3,629	1,930	617	6,848
Dec	2008	568	930	3,228	1,332	868	6,926
Total	--	6,554	4,637	30,104	5,018	29,399	75,712

Table 2: Electricity Generation, Export, Import and emission reductions

As mentioned in the Project Design Document, Emission reductions are calculated based on the difference between the power exported to the grid and the power imported i.e. the net saleable energy/net energy supplied to the grid.

The emission reductions for the monitoring period are shown below:

Billing month	Year	Gross Electricity Generated (kWh)	Auxiliary consumption (kWh)	Electricity Exported (kWh)	Electricity Imported (kWh)	Net Saleable Energy (kWh)	Baseline Emission Factor (kgCO₂/KWh)	Baseline Emissions (tCO₂)
Jan	2008	5,382,278	507,918	4,790,000	9,500	4,780,500	0.942	4,503
Feb	2008	4,826,369	462,952	4,291,000	13,000	4,278,000	0.942	4,029
Mar	2008	5,270,679	505,354	4,680,000	13,500	4,666,500	0.942	4,395
Apr	2008	4,721,065	488,747	4,169,000	27,000	4,142,000	0.942	3,901
May	2008	4,217,059	447,533	3,720,000	32,500	3,687,500	0.942	3,473
Jun	2008	4,378,097	451,222	3,866,000	28,500	3,837,500	0.942	3,614
Jul	2008	4,904,187	494,064	4,329,000	18,000	4,311,000	0.942	4,060
Aug	2008	4,523,067	482,564	3,978,000	25,000	3,953,000	0.942	3,723
Sep	2008	4,811,373	491,882	4,229,500	3,500	4,226,000	0.942	3,980
Oct	2008	4,755,370	471,481	4,208,000	16,000	4,192,000	0.942	3,948

Nov	2008	5,165,380	504,129	4,581,000	15,500	4,565,500	0.942	4,300
Dec	2008	5,255,666	592,666	4,663,000	12,000	4,651,000	0.942	4,381
Total	-	58,210,590	6,706,090	51,504,500	214,000	51,290,500	--	48,307

Emission Reductions

Baseline Emissions:

Carbon Emission Factor as per the baseline adopted (EF_y) = 0.942 kg CO₂/kWh

Energy exported to the grid = 46,841,500 kWh

Energy imported from the grid = 202,000 kWh

Net saleable energy exported to the grid (EG_y) = 46,639,500 kWh

Baseline emissions (BE_y) = $EF_y \times EG_y$
= 48,307 tCO₂

Project Emissions (PE_y): NIL

Emission Reductions (ER_y) = $BE_y - PE_y$
= 48,307 t CO₂ – NIL
= 48,307 tCO₂

Note: A detailed excel sheet showing step by step calculations for arriving Net emission reductions is given as Annexure - I.

Measures to Ensure the Results/Uncertainty Analysis

The energy exported to the PSEB is recorded from two independent set of meters - Main Meter & Check Meter as per the Power Purchase Agreement (PPA). The readings from the Main Meter are used for billing purposes. In case the Main Meter goes out of operation, the reading of the backup meter (Check Meter) is to be used for billing. Till date only the main meter has been used for billing purposes.

The calibration and testing of monitoring equipment is being carried out regularly according to the requirements of PSEB. Power Generation, Export & Auxiliary Consumption and fuel consumption is being recorded and verified daily by the Plant Manager which is thereafter approved by the Director. Since hourly data logging is being carried out along with daily reporting, the uncertainty level associated with the monitored data used for calculating emission reductions is low.

It is to be noted that there has been no change in any of the metering equipment in the current monitoring period from 01/01/2008 to 31/12/2008 (both days included). The following table indicates the details of Main meter (Export/Import) and Check meter (Export/Import) including their calibration and testing dates:

Description	Main Meter		Check Meter	
S. No.	4180597		4180598	
Capacity	200/1A		200/1A	
Accuracy Level	0.5		0.5	
Make	L & T		L & T	
Date of Calibration & Testing	09/06/2008	30/12/2008	09/06/2008	31/12/2008
Accuracy Level observed during calibration & testing	0.19%	0.32% - 0.36%	0.17%	0.14%
Calibration & Testing Authority	Punjab State Electricity Board		Punjab State Electricity Board	

In accordance with the monitoring plan, the meters at the generation end have also been test checked for accuracy. The half yearly test result details are as shown below:

Description	Gross generation meter		Auxiliary consumption meter	
S. No.	4249596		63116/3171-0405	
Capacity	600/1A		2500/5 A	
Accuracy Class	0.5		1.0	
Make	L & T		Enercon	
Date of Testing	17.06.08	04.12.08	17.06.08	04.12.08
% Error	0.18-0.19	0.20-0.29	0.40	0.40

As can be seen, the error was found to be within permissible limits (0.5%) and no calibration or replacement was considered necessary.

MPPL had developed an internal audit procedure as a measure of internal control to ensure accuracy and credibility of data reported. The following parameters were verified during the internal audit:

- a. Gross energy generated;
- b. Auxiliary consumption;
- c. Electricity exported;
- d. Electricity imported;
- e. Net saleable energy;
- f. Biomass fuel inventory;
- g. Average calorific value and
- h. Calibration & Testing records.

Any corrective actions required were promptly implemented and overall the project was found to conform to the planned arrangements of the monitoring methodology and plan. The weigh bridge used to measure biomass consumption has also been inspected by an external agency to ensure effective operation.

Roles and Responsibilities

MPPL was the sole agency responsible for implementation of the monitoring plan. Furthermore specific roles and responsibilities have been outlined in the enclosed document - GHG Performance Procedure of Malwa Power Limited.

Annexure 1

Malwa Power Private Limited Emission Reduction Calculations: 01st January 2008 to 31st December 2008

Billing month	Year	Gross Electricity generated (kWh)	Electricity exported (kWh)	Electricity imported (kWh)	Auxiliary consumption (kWh)	Net Saleable energy (kWh)	Biomass Used (MT)					Total quantity of biomass consumed (MT)	Baseline emission factor (kgCO ₂ /kWh)	Baseline emissions (kgCO ₂)	Emission reductions (tCO ₂)
							Firewood	Mustard Husk	Wheat straw	Paddy waste	Cotton stick				
January	2008	5,382,278	4,790,000	9,500	507,918	4,780,500	468	174	47	177	5,901	6,767	0.942	4,503,231	4,503
February	2008	4,826,369	4,291,000	13,000	462,952	4,278,000	516	8	213	20	5,374	6,131	0.942	4,029,876	4,029
March	2008	5,270,679	4,680,000	13,500	505,354	4,666,500	563	0	1,515	35	4,548	6,661	0.942	4,395,843	4,395
April	2008	4,721,065	4,169,000	27,000	488,747	4,142,000	542	149	2,770	12	2,635	6,108	0.942	3,901,764	3,901
May	2008	4,217,059	3,720,000	32,500	447,533	3,687,500	251	117	2,497	11	2,494	5,370	0.942	3,473,625	3,473
June	2008	4,378,097	3,866,000	28,500	451,222	3,837,500	310	177	1,834	14	3,331	5,666	0.942	3,614,925	3,614
July	2008	4,904,187	4,329,000	18,000	494,064	4,311,000	236	520	3,515	159	1,967	6,397	0.942	4,060,962	4,060
August	2008	4,523,067	3,978,000	25,000	482,564	3,953,000	282	544	4,633	220	352	6,031	0.942	3,723,726	3,723
September	2008	4,811,373	4,229,500	3,500	491,882	4,226,000	1,011	630	3,638	110	998	6,387	0.942	3,980,892	3,980
October	2008	4,755,370	4,208,000	16,000	471,481	4,192,000	1,135	1,388	2,585	998	314	6,420	0.942	3,948,864	3,948
November	2008	5,165,380	4,581,000	15,500	504,129	4,565,500	672	0	3,629	1,930	617	6,848	0.942	4,300,701	4,300
December	2008	5,255,666	4,663,000	12,000	512,808	4,651,000	568	930	3,228	1,332	868	6,926	0.942	4,381,242	4,381
Total		58,210,590	51,504,500	214,000	5,820,654	51,290,500	6,554	4,637	30,104	5,018	29,399	75,712	-	48,315,651	48,307